

INTESTINAL OBSTRUCTION.¹

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I PRESENT to you today a study of the general subject of intestinal obstruction, with deductions drawn from an analysis of 52 of my private cases taken in succession. The subject will be treated from a diagnostic standpoint, for early and correct diagnosis is still the most urgent need in the treatment of these grave cases. Certain conditions not generally included under the heading of intestinal obstruction are considered, since the total or partial occlusion of some part of the digestive tract was a prominent clinical feature. Many cases of septic peritonitis and similar conditions involving motor paralysis have been noted meanwhile, but are not included in this report.

Of the 52 cases, 29 were males, 23 females; 14 of these were in the fifth decade, 12 in the third, 8 in the fourth, 8 in the first, 7 in the sixth, none in the second; 33 of the patients were operated upon, and 2 others explored, by different surgeons of Colorado, while the diagnosis was established by postmortem examination in 5 other cases. In Case XXXIV the diagnosis was rendered certain by the projection of the intussuscepted bowel through the anus, operation being refused. In 11 cases the evidence as to the cause of the obstruction was clinical rather than anatomical. In 3 of these acute dilatation of the stomach existed, the obstruction being relieved by postural treatment in 2, after continuous fecal vomiting had existed in one for forty-eight hours and non-fecal vomiting in another for the same time. The third patient died unrelieved.

In 3 cases septic paresis of the bowel was regarded as the cause, 1 dying. In 1 case impaction resulted from chronic appendicitis; in 1, impaction of the sigmoid from unknown cause; in 1, motor paralysis from acute pneumonia with diaphragmatic pleurisy; and in 1, paralysis from inflammation about tuberculous glands palpable in the abdomen, all 4 recovering without operation. The last case died from obstruction, associated with the presence of an immense malignant growth in the abdomen of unknown origin, no post-mortem being permitted.

There were in this series 12 cases definitely due to bands or adhesions from previous operation, and 9 not so caused, a total of 21 out of 52 cases. The previous operations were performed for appendicitis five times, pelvic tumor three times, previous obstruction twice, gall-bladder disease and gastro-enterostomy for ulcer,

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each once. The bands or adhesions in the 9 cases not previously operated upon were found to be due to former appendicitis in 6 cases, to pyloric ulcer and tuberculous peritonitis in 1 case each, while 1 case due to an omental band was probably congenital. Obstruction from cancer took second rank—6 cases—in three instances being in the colon, in 2 in the mesentery, and in 1 the exact location was not learned, a large tumor filling the abdomen.

Tuberculous peritonitis caused obstruction in 4 cases, acute dilatation of the stomach (see explanation below) in 3 cases, intussusception in 3 cases, congenital dilatation of the colon in 2 cases, twist in 2 cases, Treitz's hernia in 2 cases, thrombosis of the mesenteric vessels in 2 cases, septic paresis in 3 cases, general adhesive peritonitis, congenital dilatation of the small intestine, congenital pyloric stenosis, paresis from diaphragmatic pleurisy in connection with pneumonia, and impaction in the sigmoid from unknown cause, in each, 1 case.

More than one cause of possible obstruction was present in 5 cases, each being listed above according to the most active agency in producing the obstruction. The complications were: Acute obstruction by bands from old appendicitis, with 4 partial constrictions from tuberculous ulcers also present (operation by Dr. Lyman, recovery); acute obstruction from a band at the site of previous appendicitis and a cancer of the colon on the opposite side of the abdomen, not fully blocking the bowel (operated by Dr. Harris); obstruction from a band from previous operation and congenital small colon dragged down into a V shape (operated by Dr. Lyman, with complete recovery); twist coming on while skipping rope, accompanied by acute tuberculous peritonitis (operated by Dr. Perkins, with recovery from both conditions); obstruction by congenital omental band, Meckel's diverticulum giving opportunity for obstruction, but apparently taking no part in this attack.

In 3 cases the patient had shortly before been made very ill by eating some food disagreeing with the digestive organs, adhesions from recent appendicitis, thrombosis of the superior mesenteric artery, and twist affecting the small bowel being the cause of obstruction in the respective cases. In the first 2 I regarded the food poisoning as the remote cause of the obstruction.

In Case II the congenitally small colon was probably the cause of the operation for obstruction twelve years previously, which operation in turn had caused obstruction by a band.

Case XV was operated upon for appendicitis five years ago, and afterward under my care had four separate attacks of obstruction due to adhesions, and relieved each time by operation by Dr. Dean; two of these were acute in character. She is counted but once in this report.

Of the operated cases, 21 recovered from the obstruction, 1 subsequently dying of uremia. Of the non-operative cases, 8 recovered,

1 subsequently dying of acute pneumonia. Of cases operated upon, 12 died, and also 2 cases in which exploration only was made, hopeless cancer being found, the death being due to the gradual development of the growth. Of the 21 cases operated upon which recovered and the 8 cases recovering without operation, 29 in all, we need say but little here. Let us study the 12 cases operated upon and the 2 explored which were lost, and the 9 cases dying without operation, to see if better results could have been obtained under ideal conditions.

Case VII had been injured in a runaway twenty-four years before, with resulting obstruction, relieved by operation twelve years later. Dr. Wetherill, in the second obstruction, divided constricting bands which had reformed, with relief to the obstruction, but the man died of uremic coma. Probably no better result could be hoped for, for the operation was performed as soon as the obstruction was fully declared, and especial care was taken with the anesthesia because of the presence of albumin and casts.

Case IX was poisoned by eating white fish preserved with formalin, some of the layers of the fish being recognizable in the vomitus on the eighth day. The obstruction came on the ninth day, and was found to be due to thrombosis of the superior mesenteric artery, requiring resection of thirty-six inches of small intestine. In his weakened condition after nine days of vomiting and purging, probably nothing could possibly have saved him. We did not, of course, know of the desperate nature of the trouble before the exploration.

Case II had a twist of the small intestine, and did well until pulmonary embolism occurred, a contingency we cannot guard against. Case XIII was that of a rapidly developing cancer of the colon with acute obstruction, promptly relieved by excision. The operation was necessarily extensive. Death occurred from perforation after several days. The operation was performed by a surgeon of great experience and good judgment, and I believe no better result could have been attained under the circumstances. Case XXXV was a duplicate of the last case in a girl, aged twenty-one years, in the hands of another surgeon equally experienced. Death resulted from the same cause. Case XVI was promptly operated upon, and five separate points of more or less complete obstruction were found resulting apparently from a previous pyloric ulcer, and the operation was, of course, a tedious one. The patient died of shock.

Case XXIV was relieved of the obstruction by a band from a former appendicitis, but died from the shock of a prolonged operation for the removal of a cancer of the colon on the opposite side of the abdomen and which had no part in the obstruction. It was not even suspected until the surgeon felt it in examining the abdomen before closing up the wound after relieving the obstruction. These

cases are always desperate. Case XXVII was the first one of this list that offered a reasonable hope of recovery, but he came to our attention only after eighteen inches of small bowel had become gangrenous from intussusception, and died from the shock of the operation. Earlier diagnosis and operation would probably have saved his life. Case XXXVII had obstruction from an omental band, but was likewise seen too late. Case XL was one of the rare instances of chronic adhesive peritonitis, always fatal so far as I know.

In Case XLI a definite history of ulcer with hematemesis occurring ten years previously was obtained, with normal health until one year before operation. I diagnosticated the scar of a past ulcer not obstructing the pylorus, and an active ulcer at the pylorus with complete obstruction, the latter half of the diagnosis being based upon the obstruction, pain, high gastric acidity, and recent hematemesis with the previously clear history of ulcer. A scar two inches long was found about three inches from the pylorus on the anterior wall, but instead of an ulcer at the pylorus, Dr. Freeman found a small Treitz's hernia with absolute obstruction of the duodenum. The patient did not survive the operation. From the intermittency of the symptoms I believe I should have avoided the erroneous diagnosis of pyloric ulcer, and diagnosticated some intermittent strangulation, though the exact cause was probably not possible of diagnosis.

Case XLIV was one of congenital pyloric stenosis, promptly diagnosticated and operated upon almost immediately by Dr. Lyman on the third day of life; a gastro-enterostomy being performed. The baby died of shock. I do not believe it could have been saved by any method of treatment. Case XLVI was one of Treitz's hernia, the sac containing practically the entire small bowel and the cecum. Gangrene had already occurred before Dr. Freeman was called—another example of unnecessary delay, with death as a result. Cases XLIX and LI were explored and hopeless cancer found—no attempt at relief of the obstruction being possible. Of the cases dying without operation, one baby (Case XXXIV), with intussusception, should have been saved, but operation was refused. Case VI was an imbecile with some type of septic peritonitis causing complete obstruction, and was moribund when seen. Earlier diagnosis should have saved him.

Case XVIII had intermitting obstruction from a band from former appendicitis. Although a physician, he absolutely refused operation. He should have been saved.

Case XXI had thrombosis of the superior mesenteric artery due to syphilitic endarteritis. He was then recovering from syphilitic hemiplegia, and his general condition was so bad that Dr. Freeman and I decided it best not to attempt operation. The autopsy confirmed us in this view of the case. Case XXIII was obviously

a hopeless cancerous mass in the abdomen. Case XXXIII was that of a child, aged eleven weeks, with enormous congenital dilatation of the small bowel with transverse "steps" distinctly shown in the abdominal wall. After seeing the postmortem examination I was confirmed in my view of the utter hopelessness of relief. Case XXXVI had cancer of the mesentery, proved by autopsy to have been utterly inoperable. Case XLVIII had obstruction from the so-called acute dilatation of the stomach, but died from associated aspiration pneumonia. Case LII was one of congenital dilatation of the colon, having, like Case XXXIII, transverse furrows across the abdomen, leading me to make an erroneous diagnosis of dilatation of the smaller bowel. Two feet of the latter were so affected, but the main trouble lay in the colon.

Thus, of the 23 cases lost, 7 had cancerous disease and were practically hopeless from the start. The fatal results in the 2 cases of congenital dilatation of the intestine and those with syphilitic arteritis, uremia, ptomaine poisoning, pulmonary embolism, chronic adhesive peritonitis, and aspiration pneumonia were unavoidable from our standpoint. One of the cases of Treitz's hernia and the congenital pyloric stenosis were on the borderline with the chances against success. Two could probably have been saved if operation had been accepted when offered, and 4 more if seen earlier. Considering the desperate nature of the condition I am studying, I feel that the results obtained are a great tribute to the skill of the surgeons with whom I am associated. Practically, the only way in which the mortality could have been decreased in this series of cases would have been in earlier diagnosis and earlier operation.

Much has been written of acute dilatation of the stomach, yet many of the cases are so ill-defined as to pass unrecognized. The typical vomiting of large quantities of fluid was present in but 1 of the 3 cases quoted. In the other 2 gas was present in the stomach in abundance, but only small quantities of fluid were vomited. The relief of these 2 cases by turning them on the abdomen, with the idea of lessening the constriction of the duodenum by the drag of the mesenteric vessels through the postural change (as suggested in the first one by Dr. Freeman), was very striking.

Case L, of congenital dilatation of the colon, had previously gone ninety days without a stool, and passed forty-five pounds of feces when finally relieved. The baby, aged one year, with a similar condition promised nothing from operation, and died unrelieved.

We should all watch carefully for the cases of threatening obstruction from sagging of the transverse colon. The trouble is so easily demonstrated by the bismuth injection and the x-rays, and relief appears so promising from recently introduced operative procedures, that they should be much less troublesome than they have been hitherto. In several cases that I have seen which fell short

of complete obstruction the relief by fixation in a better position has been very satisfactory, and anastomotic operations promise still more complete relief. No case of obstruction by Meckel's diverticulum nor by gallstone or other foreign body occurred in this series, nor was any observed following concussion of the abdominal wall.

Careful inquiry and physical examination will generally enable us to avoid opening the abdomen in cases of obstruction associated with pneumonia and that occasionally seen in nephritis. In one case of incomplete obstruction not included in this list the development of erythematous and urticarial lesions, hemorrhage from the kidneys, ecchymosis and joint pains decided us against operation, the case being a typical one of erythema with visceral lesions. It fully recovered in a few days under medical treatment.

While studying this series, Dr. H. L. Taylor found it necessary to operate upon one case of obstruction in lead poisoning. He found the small bowel so firmly contracted in certain sections that it was practically a solid cord, and no other cause of obstruction could be found. The patient recovered under purgatives. Such a possibility should be more widely recognized.

The mortality of 767 cases of acute obstruction gathered by Scudder from Willms' compilation, and operated upon by fourteen of the foremost surgeons of Europe, was 351, or slightly less than 46 per cent. Of the 121 cases occurring in the Massachusetts General Hospital, and reported by Scudder, the mortality was 60 per cent.; 33 of our cases were actually operated upon (2 were simply explored), and to make our statistics comparable with those given above 6 are thrown out because of being subacute or chronic obstructions. One case was operated upon twice for recurring acute obstruction, and is counted but once in the list, so that there were in all 28 operations for acute obstruction, with a total of 14 recovering—a mortality of 50 per cent.

Many investigators have studied the varying effects of obstruction at different points in the intestinal canal, and the summary of their views by Scudder presents the subject well. For the diagnostician the important deductions are as given below:

Obstruction is more acute and more dangerous according as its location is higher in the canal. Maury seems to have demonstrated that the earlier mortality in high duodenojejunal obstruction may be due to the absorption of certain biliary poisons normally diluted and suspended in the secretions of the bowel, but in case of obstruction, held and absorbed.

Obstruction does harm because of the infection taking place rather than from its purely mechanical features (Reichel). The paralysis of the wall of the gut, absorption of toxic material, accumulation of gas, pressure effects from this and the associated congestion, blocking of the intestinal circulation, gangrene, perforation,

and death are all dependent upon infection. A general septicemia, in which the colon bacillus takes the most prominent part, is often the final cause of death. The permeability of the wall of the infected loop to bacteria is an important factor, but a poisoning by bacterial toxins may be present without such permeation of bacteria into the peritoneal cavity.

If life is to be saved the advance of pathological processes in the bowel must be averted by early operation. If we could be certain of the obstruction early enough in the case, and have the patient operated upon at once by a competent surgeon, the death rate could be nearly wiped out. Delay comes from non-recognition of the early signs of the obstruction, and hesitation because of fear that the abdomen may be opened unnecessarily. As in so many acute abdominal conditions the physician is so anxious to be absolutely certain of his ground that he too often waits for the advent of marked shock, fecal vomiting, and extreme distention. These mark, not the earliest time for surgical intervention, but the time of such advanced destructive lesions as render the operation one of great danger.

I think every one dealing extensively with acute abdominal disease finds that he recommends operation earlier and upon less absolutely certain signs as his experience increases. The physician's responsibility lies largely in excluding what we might term medical causes for obstruction, such as we may see in uremia, pneumonia, diaphragmatic pleurisy, erythema with visceral lesions, etc. If these be excluded, the surgeon should be called without sacrificing too much time in the attempt to make an exact diagnosis; we should rather take the position of advising operation in any case in which our suspicions of a beginning acute obstruction cannot be set aside by the most careful consideration of all features of the case, than of waiting until we are absolutely certain it has taken place. The price of certainty is too often death, and ten deaths occur from waiting too long where one case is damaged by too early intervention. I have never yet seen the abdomen opened for obstruction without finding abundant justification for the operation. Even cases in which advanced cancer is found should have a chance for recovery if operation can give it to them. A lingering death with fecal vomiting as a termination is so horrible that any reasonable attempt to avoid it even by an operation of great risk should be carefully considered.

The occurrence of sudden abdominal pain, followed by cessation of bowel movement, without material rise in temperature, but with increasing frequency of the pulse, with abdominal distention, often local in the affected loop of bowel (Wahl's sign), and accompanied by visible peristalsis, often with nausea and vomiting, and without the tenderness and involuntary rigidity seen so typically in acute appendiceal, gall-bladder, and stomach lesions, should

suggest acute intestinal obstruction with so much probability that we should avoid opiates if possible, withhold all food, and all cathartics by the mouth, and attempt to relieve the obstruction by enemas. At this time, as Ewald has shown, the stomach contains matter regurgitated by reverse peristalsis from the upper bowel, and the stomach washings should be watched for the first appearance of fecal odor.

Obstructions high up in the canal are generally characterized by greater pain, earlier nausea and vomiting, more flattening of the abdomen, scanty urine, and earlier collapse. Low obstructions are characterized by greater abdominal distention, oftentimes with prominence of certain portions of the abdomen, indicating that the entire colon is distended, or only certain portions of it, or only the small bowel. The prominence of a "horseshoe" of distended bowel in the course of the colon is very striking evidence of obstruction low down, while the absence of this and the presence of smaller prominent loops in the central abdomen suggests that the lower small bowel or cecum is affected. Previous operation suggests obstruction by bands or adhesions. A history of gall-stone disease suggests the possibility of obstruction by a large stone escaped by ulceration into the bowel. In the insane we think of obstruction through foreign bodies swallowed. In patients with diarrhoeal and dysenteric diseases the possibility of obstruction through masses of bismuth or other insoluble medicament is present.

The presence of blood in the stools and a tumor in the abdomen in a young patient with obstruction of sudden onset suggests intussusception.

The beginning of the trouble after such exercise as skipping rope and certain contortions indulged in by boys in the gymnasium suggests a twist. A tuberculous history and the presence of palpable glands suggest obstruction by an acute process connected with a tuberculous peritonitis. A history of typhoid fever, duodenal ulcer, syphilis, or dysentery suggests a gradually contracting cicatrix with a sudden obstruction at the end. Gradual loss of weight and enlargement of accessory glands speak for cancer. Syphilis and toxemic conditions suggest the possibility of mesenteric thrombosis, and serious valvular disease and endocarditis the chance for mesenteric embolism. Blood is generally present in the stools in this class of cases, and was freely vomited in Case XX of my series.

Obstruction without any definite localizing or diagnostic signs speaks in general for some type of obstruction secondary to interference with the circulation of the gut, as from thrombosis or cancer of the mesentery. Obstruction from chronic intussusception is difficult of diagnosis unless the tumor be found. An indefinite obstruction with prominent tumor may be found in volvulus of the omentum.

Rectal examination, investigation of the urine for indicanuria, of the blood for leukocytosis, a well-kept record of pulse and temperature, careful physical examination of the chest, and, in general, the utmost watchfulness should be employed. The mortality will probably be less in the future, as the imperative need of early diagnosis and operation are better appreciated.

I am under obligations to Drs. Cochems, Craig, Dean, Fleming, Freeman, Harris, Lyman, Taylor, Tennant, Wetherili, and Williams, with whom I saw the cases reported, and to Dr. Love for the compilation of the histories.

IDIOPATHIC CIRCUMSCRIBED SPINAL SEROUS MENINGITIS.

WITH THE REPORT OF A SUCCESSFUL OPERATIVE CASE.

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CIRCUMSCRIBED spinal serous meningitis as a distinct disease, has been generally recognized only since 1903, although it was previously described by Schlesinger¹ in 1898, who found such a condition at necropsy. Since then cases have been recorded by Krause² and Oppenheim,³ Bruns,⁴ de Montet,⁵ Mendel and Adler,⁶ and others, and by Horsley,⁷ who in February, 1909, described 21 cases. In this country the first report was made by Spiller,⁸ who in 1903 recorded a successful operative case, reporting it at that time as a cyst in the pia-arachnoid. Since then Bliss⁹ has reported one case and Munro six. It is probable, however, that other surgeons and neurologists have observed this condition, but did not recognize it. This was the experience of Munro.¹⁰

It is of the utmost importance to recognize clinically circumscribed spinal serous meningitis, inasmuch as an early operation

¹ *Beit. z. Kennt. d. Rückenm. und Wirbeltumoren*, Jena, 1898.

² *Verhandl. d. Gesell. Deut. Naturf.*, 1900, ii Theil, p. 194; *Berl. klin. Woch.*, 1900, p. 827; *Verhandl. d. deut. Gesell. f. Chir.*, 1907, ii Theil, p. 598; *Deut. Zeitschr. f. Nervenheilk.*, 1908.

³ *Mittheil. aus d. Grenzgeb.*, 1900, p. 607; *Verhandl. d. Gesell. Deut. Naturf.*, 1906, ii Theil, p. 194; *Beit. z. Diag. und Therap. d. Geschw. d. central. Nerv. System*, Berlin, 1907.

⁴ *Berl. klin. Woch.*, 1908, p. 1753.

⁵ *Cor.-Bl. f. Schweiz. Aerzte*, 1908, p. 698.

⁶ *Berl. klin. Woch.*, 1908, p. 1596.

⁷ *Brit. Med. Jour.*, February, 1909.

⁸ *Univ. Penn. Med. Bull.*, 1903.

⁹ *Jour. Amer. Med. Assoc.*, March, 1909.

¹⁰ *Surgery, Gynecology, and Obstetrics*, March, 1910, pp. 235 to 244.